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Mammalia, Chiroptera, Phyllostomidae, *Artibeus cinereus*: First record in the state of Paraná, Southern Brazil

Carolina Scultori ¹

Daniela Dias ²

Adriano Lúcio Peracchi ³

¹ Universidade Estadual de Campinas, Instituto de Biologia, Programa de Pós-Graduação em Ecologia.
Caixa Postal 6109. CEP 13083-970. Campinas, SP, Brazil. E-mail: scultori@gmail.com

² Laboratório de Biologia e Parasitologia de Mamíferos Silvestres Reservatórios, IOC, Fundação Oswaldo Cruz.
Avenida Brasil, 4365 Manguinhos. CEP 21040-360. Rio de Janeiro, RJ, Brazil.

³ Universidade Federal Rural do Rio de Janeiro, Instituto de Biologia, Laboratório de Mastozoologia.
BR 465, km 47. CEP 23890-000. Seropédica, RJ, Brazil.

The genus *Artibeus* Leach 1821 comprises 18 species of mainly frugivorous bats in three subgenera: *Artibeus* (nominal subgenus), which includes the larger species, and *Dermanura* Gervais 1856 and *Koopmania* Owen 1991, both including smaller species (Simmons 2005).

Artibeus concolor Peters 1865, of the monotypic subgenus *Koopmania*, has been recorded in the Northern, Northeastern (Ceará and Piauí states) (Peracchi et al. 2006), and Central-western regions of Brazil (state of Goiás) (Zortéa and Tomaz 2006). Four species of the subgenus *Dermanura* occur in Brazil: *Artibeus anderseni* Osgood, 1916, with records in the states of Acre, Amazonas, Pará, Roraima, Rondônia, and Mato Grosso; *A. glaucus* Thomas 1893, which occurs in the Northern (Pará and Roraima states) and Southern regions of Brazil (Santa Catarina and Rio Grande do Sul states); *A. gnomus* Handley, 1987, recorded in the states of Amazonas, Pará, Bahia, Espírito Santo, and Mato Grosso; and *Artibeus cinereus* (Gervais 1856), which has its type locality in the city of Belém, state of Pará (Peracchi et al. 2006; Zortéa 2007).

According to Peracchi et al. (2006), *A. cinereus* has already been recorded in Northern (Acre, Amazonas, Amapá, Pará, and Rondônia states), Northeastern (Alagoas, Bahia, Maranhão, Paraíba, Pernambuco, Piauí), Central-western (Distrito Federal, Mato Grosso), and Southeastern (Espírito Santo, Minas Gerais, Rio de Janeiro and São

Paulo) Brazilian regions. There are also records of occurrence in the state of Sergipe (Mikalauskas 2005). In Southern Brazil, *A. cinereus* was recorded only in the state of Santa Catarina (Fogaça and Reis 2008).

Artibeus cinereus is a frugivorous and seed disperser bat found in primary, riparian forests and fragments of Atlantic Forest; it also occurs in the Savanna domain (Zortéa 2007). This bat lives in small groups and uses vegetation as roosting sites, including leaf-tents (Simmons and Voss 1998). The goal of this paper is to report the first record of *A. cinereus* in the state of Paraná, Southern Brazil.

During bat field studies conducted at the *Reserva Natural Morro da Mina* (RNMM), in the state of Paraná, we captured three adult specimens of *A. cinereus*. The reserve, a Natural Patrimony Private Reserve, comprises an area of 3,400 hectares and is located in the Antonina and Morretes municipalities (25°21' and 25°25' S, and 48°46' and 48° 51' W; Figure 1). The reserve neighbors the Environmental Protection Areas of the *Serra do Mar* and *Guaraqueçaba*, on the largest contiguous remnants of Atlantic Forest in Brazil (SOS Mata Atlântica and INPE 2008). The main vegetation types, according to the Veloso et al. (1991) classification, are pioneer formations under marine and river-flooding influence, and the subformations of lowland, submontane, and dense, moist forests (Ferretti and Britez 2006).

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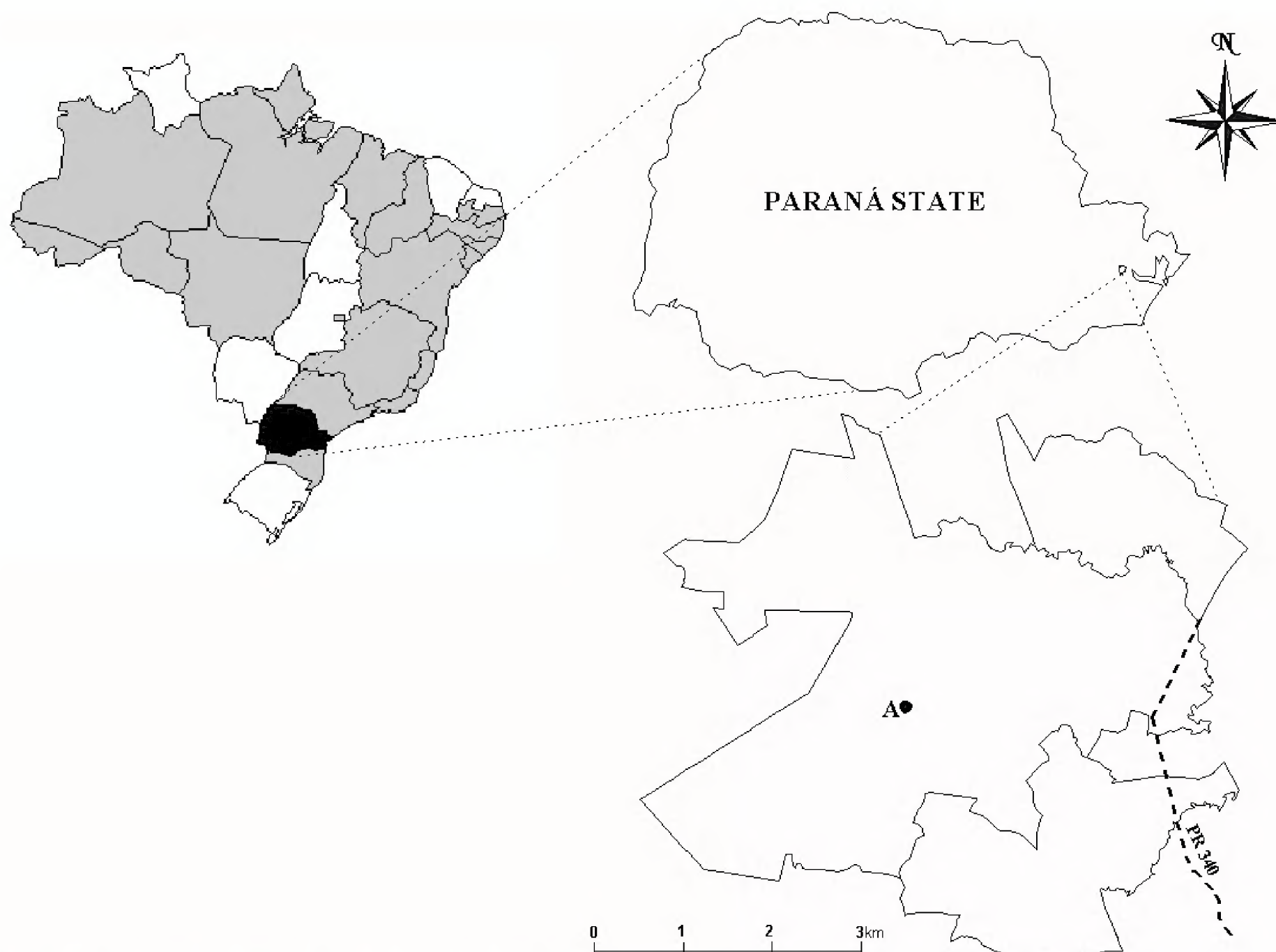


Figure 1. Location of the Submontane Forest (A) where *A. cinereus* was captured in the *Reserva Natural Morro da Mina*, state of Paraná (black). Additional Brazilian states where this species is known to occur are in gray. The dotted line is the highway PR-340.

Systems of secondary vegetation occur as well, resulting from the total disturbance of the original vegetation. Thus, the reserve is now represented by a mix of initial, middle and advanced states of succession (M. Borgo personal communication).

Following Köppen's classification, the climate of the region is Cfa, or mesothermic subtropical humid. The average annual temperature is between 20.8 and 22 °C, with more than 2000 mm of precipitation each year occurring mostly from January to March. The average air humidity is 85 % (Ferretti and Britez 2006).

The *A. cinereus* specimens were collected with mist nets opened in tree-fall gaps from the ground to the forest canopy (about 30 m of height), on the "Trilha da Samambaia" (25°22.749' S and 48°48.415' W, altitude of 43 m above sea level), in a submontane forest area in an advanced stage

of regeneration, after selective logging. The nets (12 x 3 m) were opened after sunset and kept opened until dawn in May, June, and July 2008, three nights per month. The total netting effort, calculated following Straube and Bianconi (2002), was 16,416 m².h. This effort resulted in 103 captures of 13 bat species. All specimens of *A. cinereus* were preserved in 70 % alcohol and were deposited in the Mastozoological Collection of the *Museu de História Natural Capão da Imbuia* (MHNCI), in Curitiba, Paraná. The first specimen (MHNCI 6096), a male, was captured on May 23rd, 2008, at 03:50 h, 15 m above ground-level. On June 25th, 2008, a female was captured (MHNCI 6097) at 04:52 h, five meters above ground-level. The third specimen (MHNCI 6095), a male, was captured at 21:40 h, four meters above ground-level, on July 25th, 2008. None of the individuals presented evidence of reproductive activity.

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All the specimens have the diagnostic features proposed by Handley (1987), Simmons and Voss (1998), and Lim and Engstrom (2001) to *A. cinereus*. The dorsal color is medium to dark grey, and the dorsal fur is tetracolored (white basal band followed by a medium to dark grey band, another lighter band, and a distal medium to dark grey band). The ventral fur is medium grey, with a white base and slightly whitish tips. On the forearm, the base of the dorsal surface is covered by a dense, long, and smooth pilosity. The interfemoral membrane is dark grey or almost blackish, broad, and with the dorsal surface slightly furred. The ears have dark grey color, with whitish (not yellowish) external border and tragus. The facial stripes are white, broad, and bright, and the noseleaf is blackish. The individuals have molars 2/2 (third lower molar

absent) and upper central incisors distinctly bilobed, with the internal lobe longer than the external. Cranially, all specimens have the supraorbital region barely inflated, deep rostrum (not flattened and without upward curvature or concavity above the dorsal surface), long and relatively broad palate, and pterygoid fossa not posteriorly narrowed. One external and thirteen cranial characters were measured using a caliper of 0.02 mm precision and criteria proposed by Taddei et al. (1998). Although *A. cinereus* has been reported from all Brazilian regions (Peracchi et al. 2006, Fogaça and Reis 2008), mensural data for this country is only available from Rio de Janeiro, in the Southeast (Dias and Peracchi 2008). In general, these measurements are close to those reported herein for the specimens from Paraná (Table 1).

Table 1. Measurements (in mm) of *Artibeus cinereus* specimens collected in the *Reserva Natural Morro da Mina*, Paraná, Southern Brazil. Acronyms of measurements: length of forearm (FA); greatest length of skull, including incisors (GLS); condyloincisive length (CIL); basal length, including incisors (BL); palatal length, including incisors (PL); length of maxillary tooththrow (MAXT); breadth across upper canines (BAC); breadth across upper molars (BAM); postorbital breadth (PB); zygomatic breadth (ZB); breadth of braincase (BB); mastoid breadth (MB); mandibular length (ML); length of mandibular tooththrow (MANT).

Characters	Female	Males	
	MHNCI 6097	MHNCI 6095	MHNCI 6096
FA	42.70	41.02	39.66
GLS	21.14	20.98	19.80
CIL	18.80	18.78	17.54
BL	16.34	16.46	15.44
PL	9.84	9.80	9.16
MAXT	6.88	6.86	6.32
BAM	9.04	9.04	8.68
BAC	5.94	5.92	5.62
PB	5.04	4.88	4.32
BB	12.22	9.32	8.90
ZB	10.60	12.44	11.12
MB	9.46	10.64	10.20
ML	13.62	13.42	12.36
MANT	7.26	7.06	6.58

Artibeus cinereus overlaps in size with *A. glaucus*, the other species in the subgenus *Dermanura* recorded in Southern Brazil, in the states of Santa Catarina and Rio Grande do Sul (Zortéa 2007). However, in *A. glaucus* (forearm 38.00 to 42.00 mm, measurements by Handley 1987), the third lower molar is usually present (Handley 1987).

The bats collected in this study represent the first record of *A. cinereus* for the state of Paraná, filling an important gap in the distribution of the species. The bat fauna of Paraná state is currently represented by 61 species (Reis et al. 2008; Scultori et al. 2009), but the present knowledge about the bat fauna of this state is still far from

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satisfactory. According to Miretzki (2003), about two thirds of the territory of Paraná is insufficiently sampled. The *Reserva Natural Morro da Mina*, where the specimens of *A. cinereus* were captured, is located in a region

considered of low priority for bat inventories (Miretzki 2003). Our results come to reinforce others studies (e.g., Miranda et al. 2006, Gazarini and Bernardi 2007) that indicate the need for continuing sampling efforts in this area.

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